Los Alamos National Laboratory

OVERVIEW

Juan L. Griego, Deputy Manager
National Nuclear Security Administration
Los Alamos Field Office

NNSA
National Nuclear Security Administration

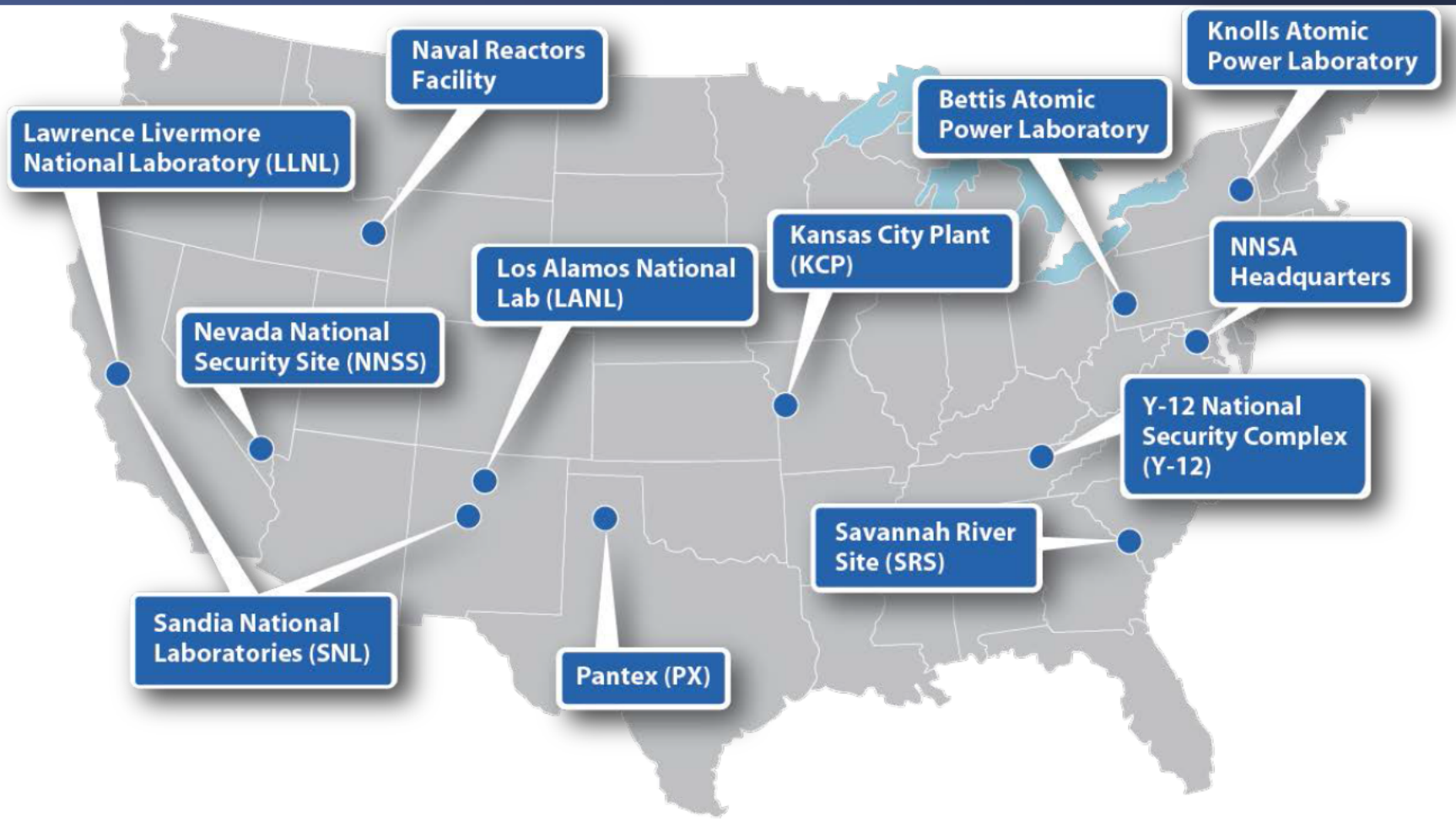
The NNSA Mission

The NNSA Mission

- Establishes military requirements
- Designs, develops, tests, and produces delivery systems
- Operates complete nuclear weapons system
- Secures and maintains nuclear weapons
- Trains personnel and plans for employment

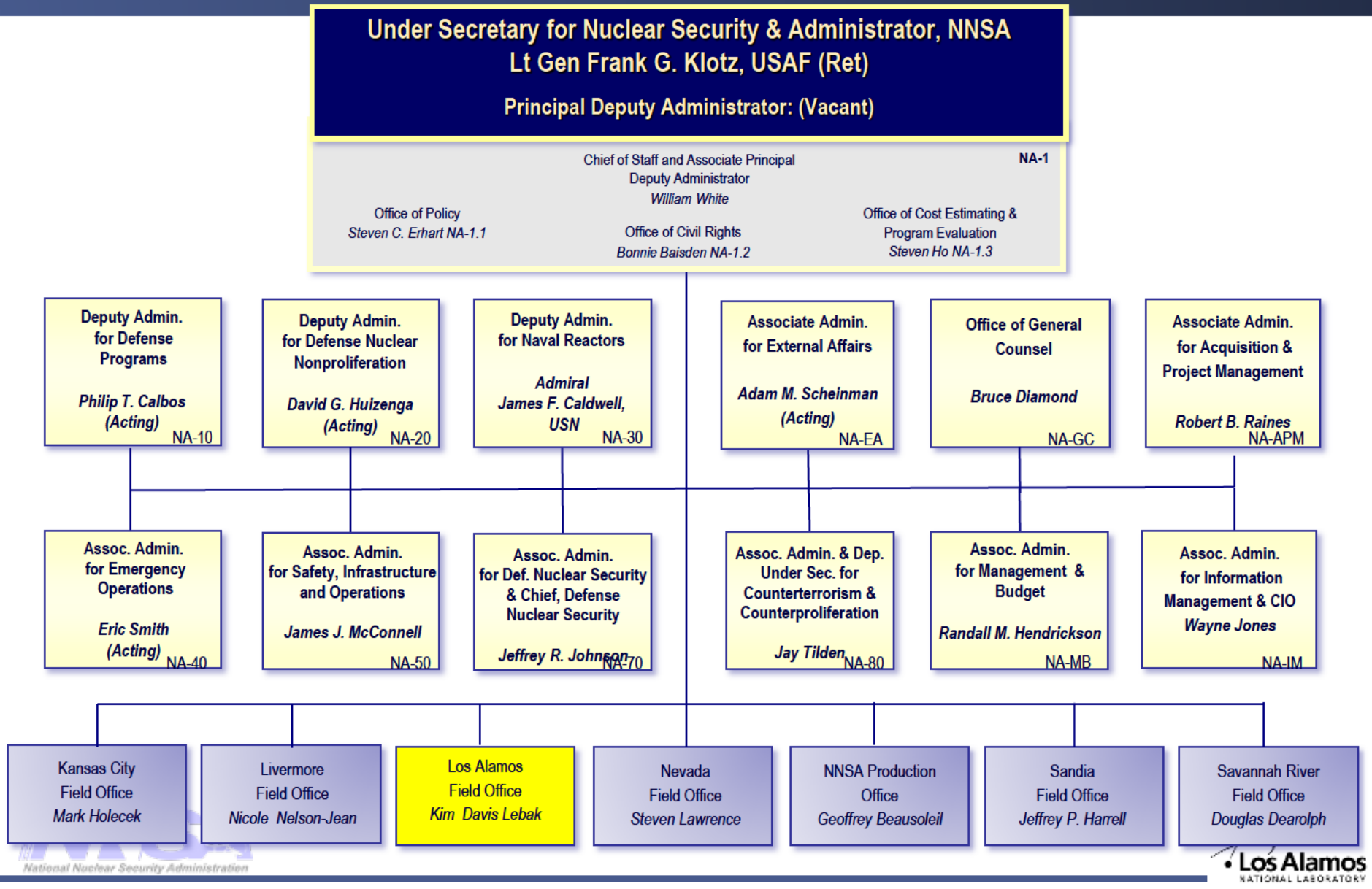
- Maintains safety, security, and reliability of the stockpile
- Researches and develops nuclear weapons science, technology, and engineering
- Supports stockpile levels
- Validates warhead safety and assesses reliability
- Produces and manages special nuclear materials

LANL is Part of the Nuclear Security Enterprise



Over 30,000 people work for NNSA and its M&O Contractors

NNSA Organization



Los Alamos, the oldest, most complex, and second largest site within the NNSA Complex

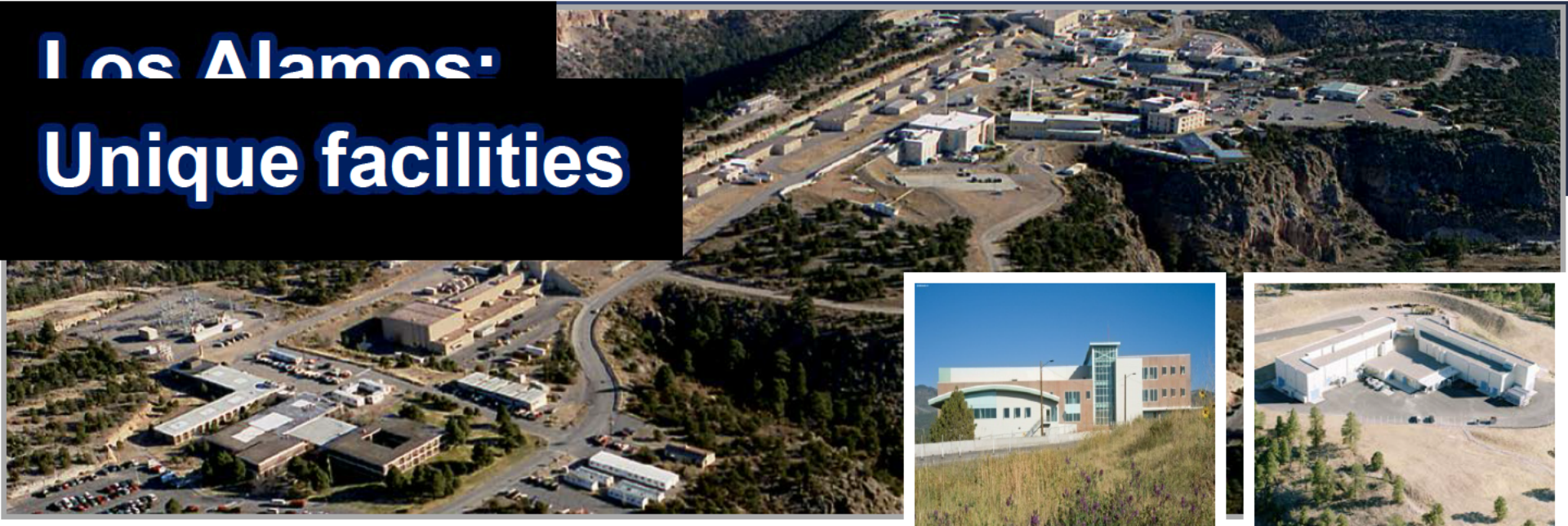
Los Alamos at a Glance :

- ~ 39 square miles
- 1,169 buildings
- 9 M gross square feet
- 268 miles of roads (100 paved)

LANL Facilities in Detail

- **LANL has a large and diverse portfolio of nuclear and high hazard facilities**
- **Nuclear Facilities (Hazard Category 2 & 3)**
  - Chemistry and Metallurgy Research (CMR) Facility
  - Weapons Engineering Tritium Facility (WETF)
  - TA-55 Plutonium Facility (PF)
  - Waste Characterization Reduction and Repackaging Facility (WCRRF)
  - Radioactive Liquid Waste Treatment Facility (RLWTF)
  - Waste Storage and Disposal Facility (Area G)
  - Radioactive Assay Nondestructive Testing (RANT) Facility
  - TRU Waste Storage Facility (TWF)
- **128 Radiological Facilities**
- **Accelerator Facilities**
  - Dual Axis Radiographic Hydrodynamic Test Facility (DARHT)
  - Los Alamos Neutron Science Center Facilities (LANSCE)

Los Alamos:
Unique facilities



- Nuclear facilities address critical stockpile stewardship challenges
- Supercomputing facilities
- DARHT allows researchers to study weapons performance
- Nanotechnology center drives critical research programs
- LANSCE draws international scientists studying materials

Radiological Laboratory Utilities/Office Building

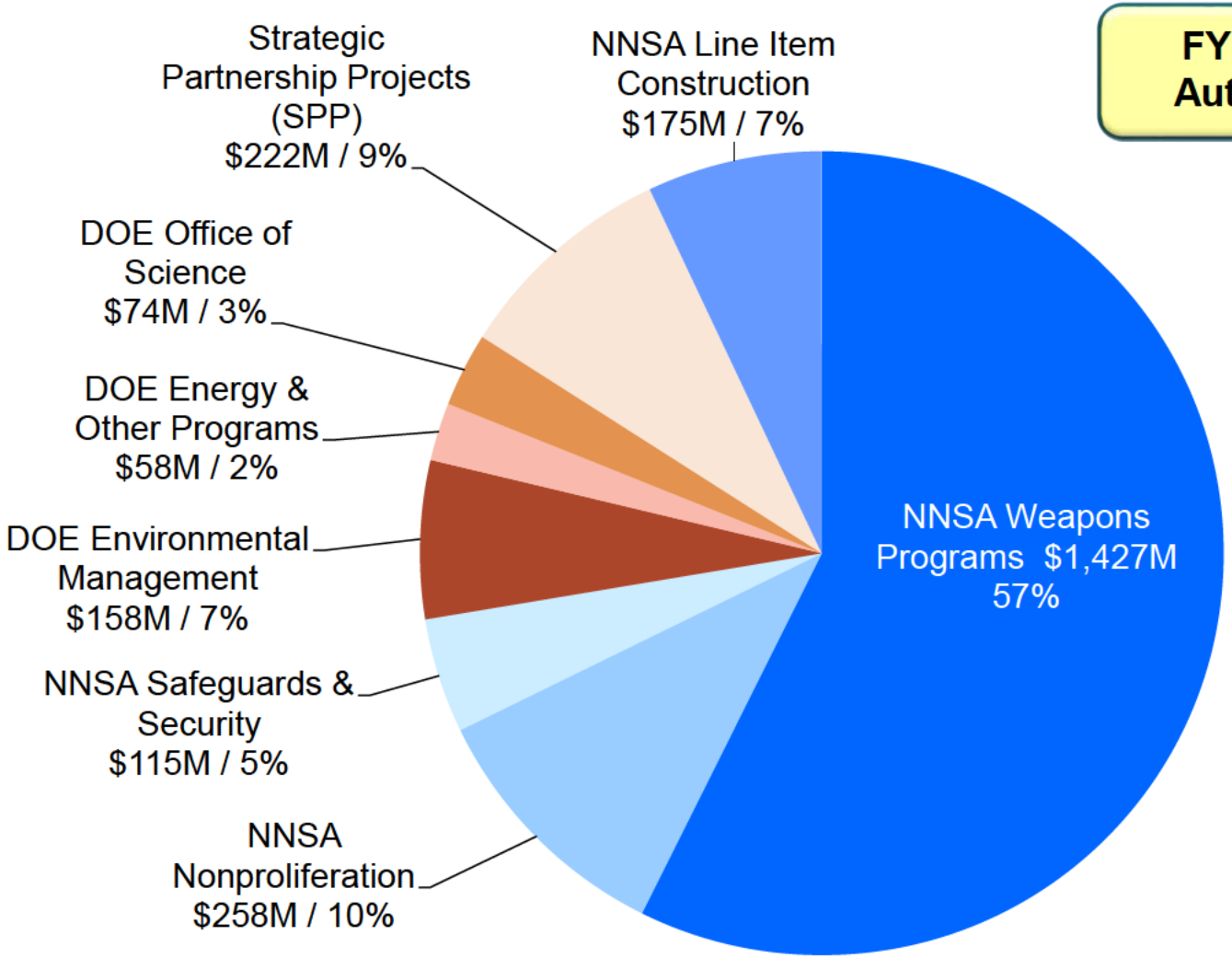
Dual Axis Radiographic Hydrodynamic Test Facility

Center for Integrated Nanotechnologies

Nicholas C. Metropolis Center

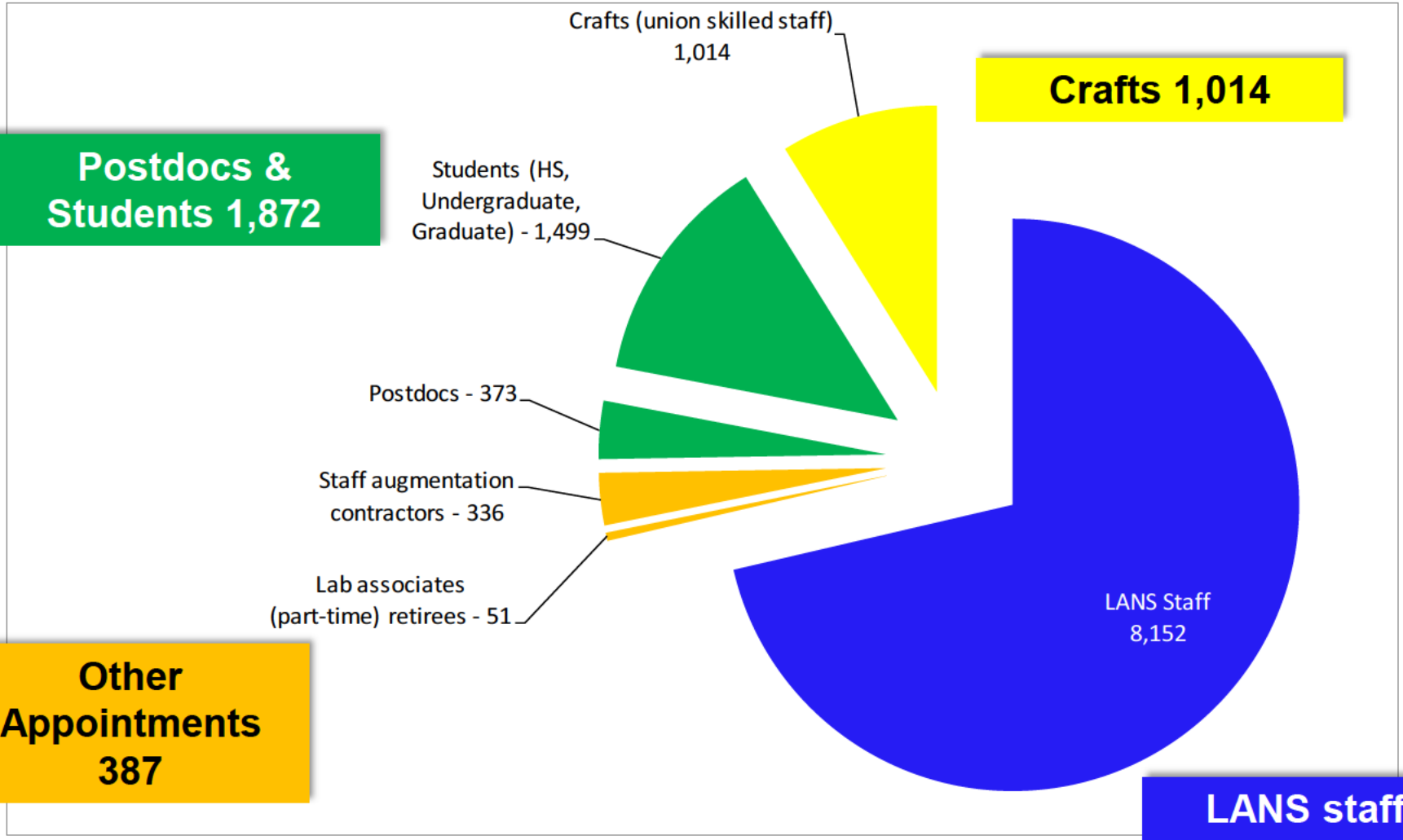
The Laboratory's programmatic funding portfolio

FY17 LANL Budget Authority = ~$2.49B

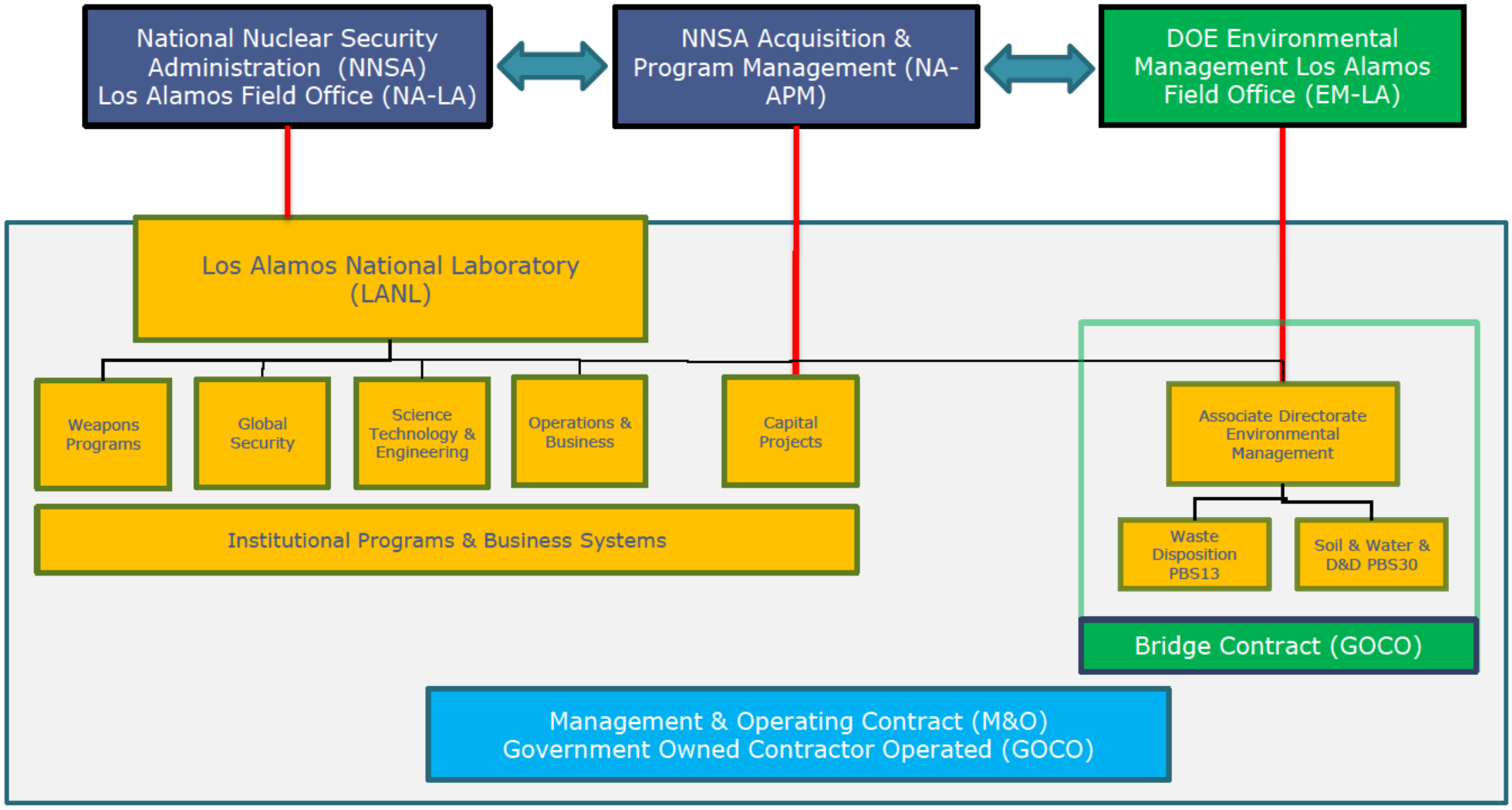


LANL Workforce August 2017 = 11,425

Numbers reflect employee headcount – does not include subcontractor workers such as security guards, construction contractors, etc.



Los Alamos National Laboratory



LANL Capital Projects Portfolio

$1.8B - $2.4B – Now thru early 2020s

Transuranic (TRU) Waste Facility Project (TWF)

- Project Cost: $99.2M
- Construction Complete – Readiness Activities underway
- Facility start-up anticipated 11/2017

Chemistry and Metallurgy Research Replacement (CMRR)

- Project Cost: $1.5-$2.04B (Critical Decision - 1 cost range)
- Schedule: REI2 and PEI1 in construction; PEI2 in Design and D&D ongoing; RC3 Environmental Assessment in progress
- Percent Complete: REI2 - 37% PEI1 - 44% PEI2 – 29%

Radiological Liquid Waste Treatment Facility (RLWTF) Upgrade - Low Level Liquid Waste (LLW) and TRU Liquid Components (TLW)

- Project Cost: LLW $89.8M TLW $62-136M
- Schedule: LLW Critical Decision 4 - 11/2018; TLW in design, Critical Decision 2/3 planned for 1QFY18
- Percent Complete: LLW 88% TLW 100% (Design)

LANL Capital Projects Portfolio

$1.8B - $2.4B – Now thru early 2020s

TA-55 Reinvestment Project (TRP) Phase II

- Project Cost: $98.9M
- Schedule: Construction complete - 6/2018
- Percent Complete: 96%

Technical Area - 3 Electrical Substation Project

- Project Cost: $28.2M
- Schedule: Construction start - May 22, 2017(A); Critical Decision 4 - September 2018
- Design Percent Complete: 90%

Exascale Class Computing Cooling Equipment (EC3E)

- Project Cost: $53M-$71M (Critical Decision - 1 cost range)
- Critical Decision 2/3 planned for 2QFY18
- Design Percent Complete: 90%

In Development

- TA-55 Reinvestment Project III

LANL Subcontracts/Unique Features

Los Alamos was one of the original Atomic Cities (Along with Hanford, WA, and Oak Ridge, TN) – there are several large subcontracts and other key stakeholders involved with operations at LANL:

- Protective Force
- Custodial
- Craft Labor
- LAFD Cooperative Agreement
- Legacy Waste Cleanup

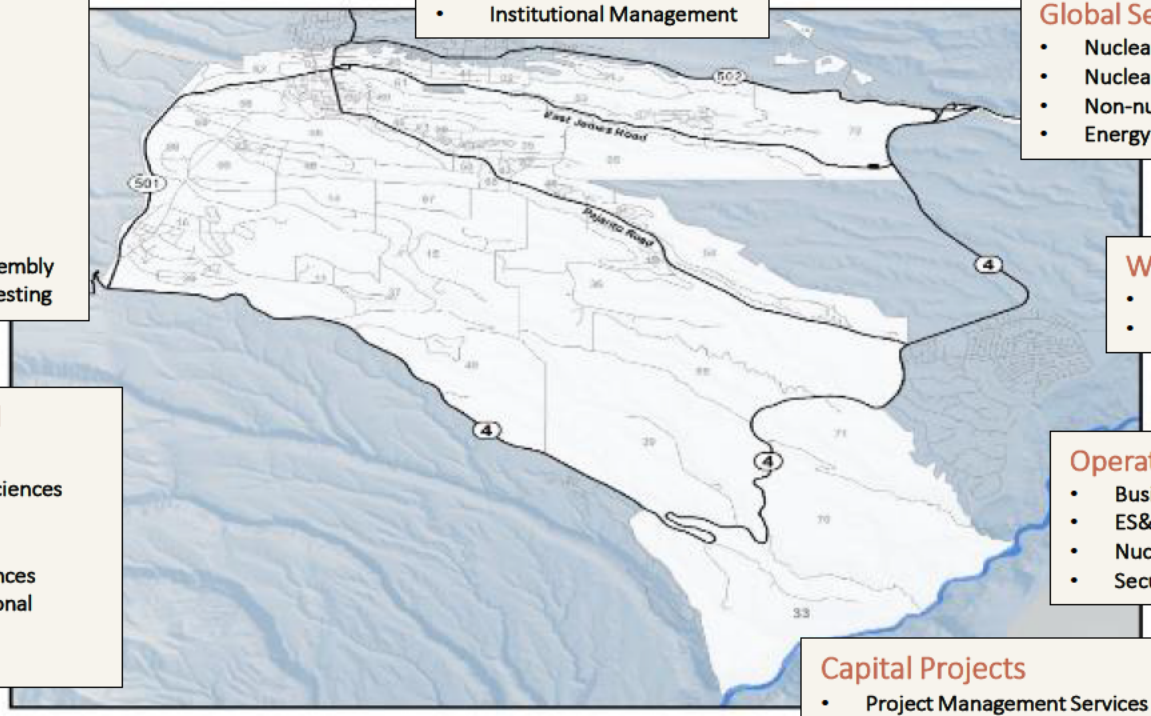
- Four “Accord” Pueblos
- State of New Mexico
- Los Alamos County
- Bandelier National Monument
- Valles Caldera National Park
- Santa Fe National Forest
- Manhattan Project National Park

LANL Site Map and Basic Organizational Structure

Weapons Programs
- Weapons Physics Design
- Weapons Physics Computation
- Weapons Engineering
- High Explosives
- Plutonium
- Tritium/GTS
- Uranium, Be, Salts, Metals
- Detonators
- Component Fabrication and Assembly
- Integrated and Environmental Testing

Director's Office
- Institutional Management

Global Security
- Nuclear Nonproliferation
- Nuclear Counter-proliferation
- Non-nuclear Threats
- Energy and Resource Security



Waste Management
- Enduring Waste
- Legacy Waste

Science, Technology and Engineering
- Chemistry, Earth and Life Sciences
- Accelerator Science
- Engineering Sciences
- Materials and Physical Sciences
- Theoretical and Computational Sciences

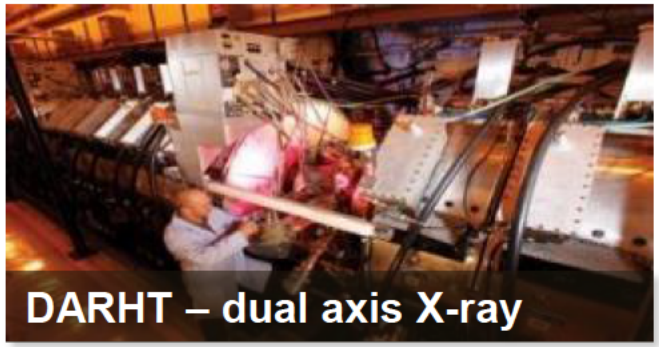
Operations
- Business Services
- ES&H
- Nuclear & High Hazards Ops
- Security and Mission Assurance

Capital Projects
- Project Management Services

Programs - Ensuring the U.S. Nuclear Deterrent

- Los Alamos helps ensure the safety, security, and effectiveness of the Nation's nuclear deterrent

- Los Alamos is the design agency for four of seven current weapons systems in the Nation's stockpile



Non-nuclear testing, modeling, simulation, and other tools and capabilities provide assurance

LANL annually assesses the stockpile and reports to the Secretary of Energy, Secretary of Defense, and the President on weapons systems reliability.

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Programs – Stockpile Stewardship

Stockpile stewardship today

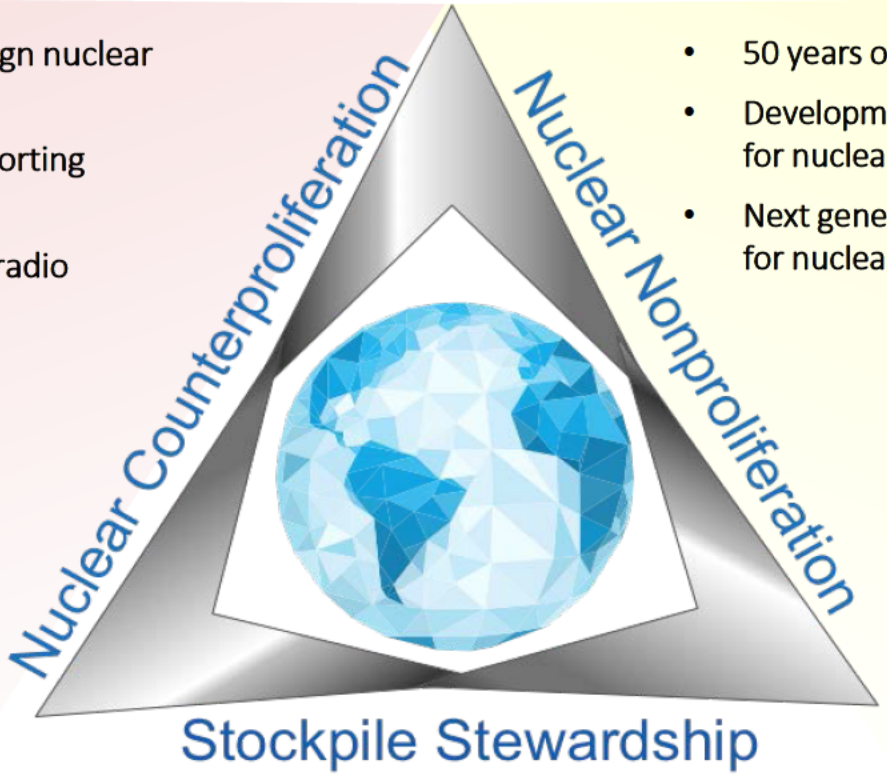
Dual-Axis Radiographic Hydrotest facility (DARHT)

Nuclear material facilities

Supercomputing

Programs - Global Security

- Assessment of foreign nuclear weapon programs
- Mini-satellites supporting DoD mission
- Next generation of radio communications



- 50 years of International Safeguards
- Development of monitoring techniques for nuclear testing
- Next generation of satellite detectors for nuclear explosions

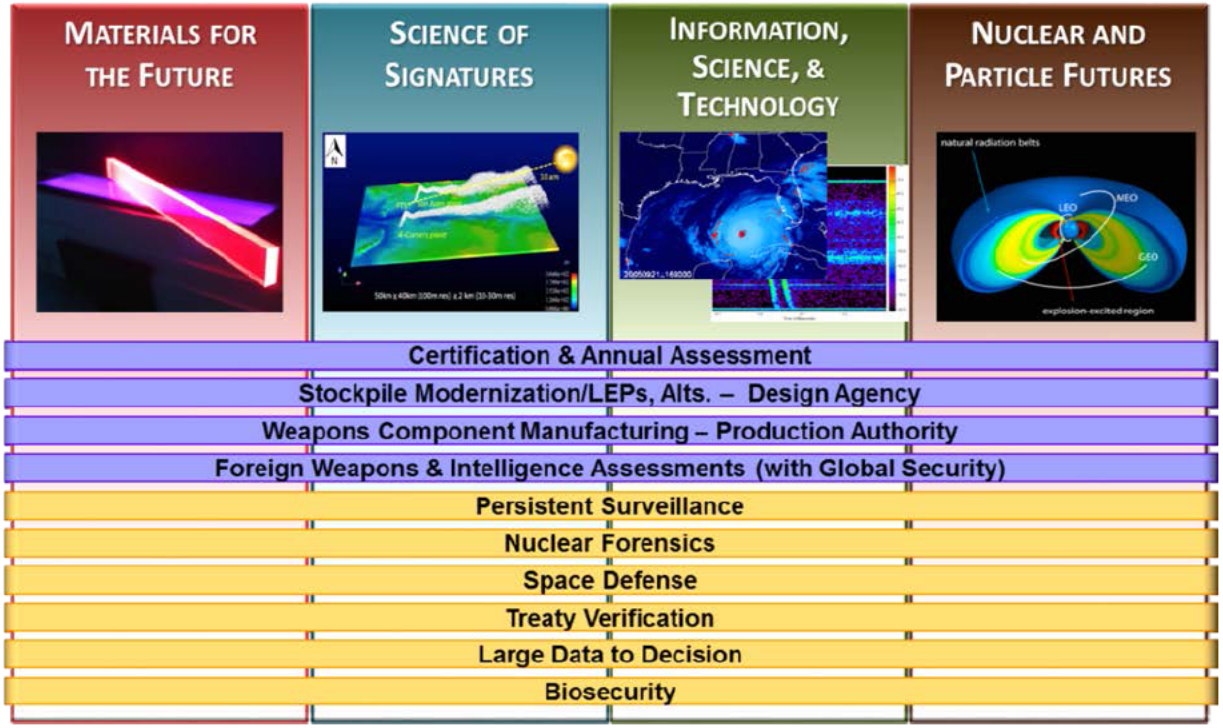
Intelligence, Defense and Counterterrorism
Nuclear Counterproliferation
Emerging Threats
Nuclear Nonproliferation and Security

Programs - Reduction of Threats of WMD and Terrorism

- Reduce proliferation threats
- Safeguard and detect radiological material
- IAEA inspector training
- Counterterrorism
- Critical infrastructure modeling
- Disaster response

Programs - Science, Technology and Engineering

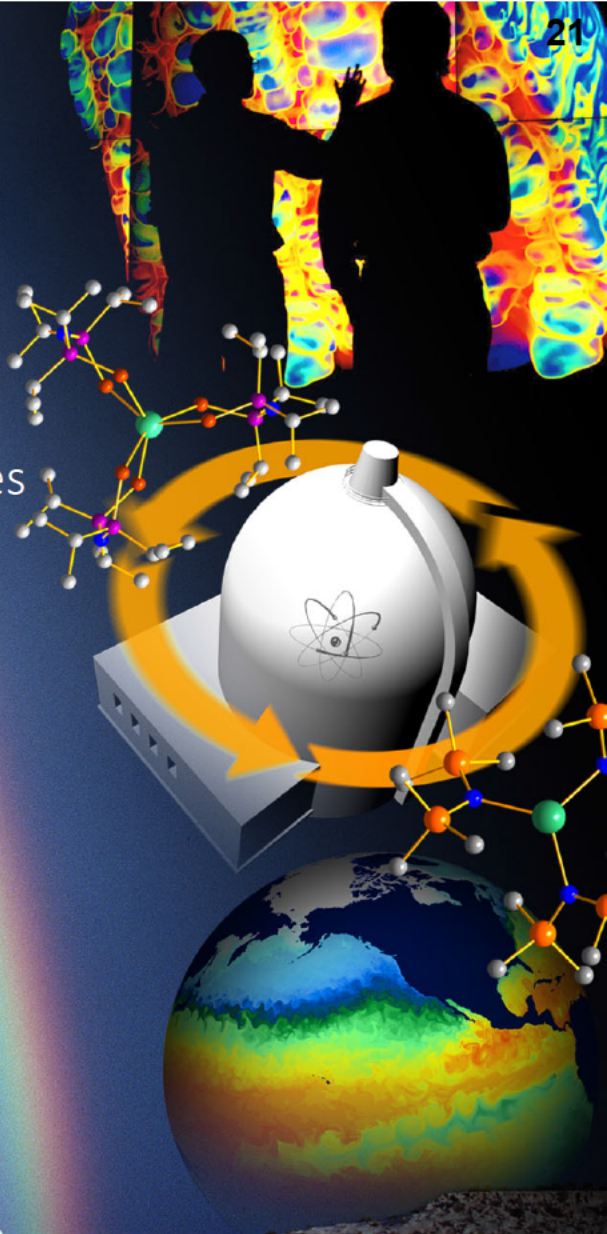
- LANL's Science Pillars provide a framework for cross-cutting mission support capabilities
- Los Alamos is recognized globally for its technical excellence
- LANL collaborates extensively with other DOE laboratories and industry to perform R&D for most DOE Science and Energy Offices and many other federal agencies
- LANL contributes to the nation's energy security solutions in a broad range of areas: nuclear, fossil, wind, and alternative energy solutions



LANL Summary

Los Alamos National Laboratory has been essential to the nation's security for more than 70 years

- Dedicated to addressing complex national security issues and the world's most difficult challenges
- Multidisciplinary science, technology, and engineering capabilities
- Unique experimental, computational, and nuclear facilities



Los Alamos
NATIONAL LABORATORY

A Tradition of Innovation at Los Alamos

1945: Los Alamos scientists conduct world's first nuclear test

1945: Nuclear weapons developed at Los Alamos help end World War II

1946: The Monte Carlo method devised by LASL scientists

1946: LASL completes world's first plutonium-fueled reactor

1951: First underground nuclear test conducted by LASL

1951: LASL conducts the first nuclear test producing thermonuclear burn

1952: LASL conducts the first full-scale thermonuclear test

1953: LASL conducts the first tactical nuclear weapon test

1954: Largest U.S. nuclear test conducted by LASL

1956: Existence of the neutrino proven by LASL scientists

1963: The heat pipe is invented by LASL scientists

1963: LASL-developed Vela satellites launched

1967: Gamma-ray bursts first detected by Vela satellites

1972: LAMPF produces an 800 MEV beam

1973: LASL's Nuclear Safeguards Program begins

1974: LAMPF ships its first medical radioisotopes

1979: IHE first used in a stockpiled nuclear weapon

1982: GenBANK established at LANL

1982: LANL's Cray X-MP named world's fastest computer

1984: LANL x-ray detectors used on GPS satellites

1988: Center for Genome Studies established at LANL

1988: LANL participates in Joint Verification Experiment

1990: National High Magnetic Field Laboratory established at LANL

1990: LANL begins participation in experiments that ultimately confirm neutrino mass

1992: LANL conducts the last US nuclear weapons test

1995: Chromosome 16 is mapped at LANL

2002: First 3D full-system weapons simulation is performed at LANL

2008: LANL's Roadrunner supercomputer breaks petaflop barrier

2009: DARHT becomes the world's most powerful x-ray machine

2012: LANL scientists produce 100T non-destructive magnetic field

2012: Curiosity Rover lands on Mars equipped with LANL instruments

What will Los Alamos do next?

Los Alamos NATIONAL LABORATORY

Thank You For Your Attention

NEXT STEPS

- This concludes the overview briefing
- Comfort break here at the Los Alamos Field Office
- Commence Site tours: (estimate 1.5 – 2 hours)
  - Two buses and a van will be available outside
  - Route will start at TA-3 area, move through Townsite, down main hill road, up truck route, down Pajarito Corridor, then around NM4 and southern/western boundary of the Laboratory
  - Reminder of security requirements
  - Administrative notes
- Start of one-on-one sessions per schedule